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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/590,376

05/23/2007

Amit Gal-On

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EXAMINER

ZHENG, LI

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/590,376	<b>Applicant(s)</b> GAL-ON ET AL.	
	<b>Examiner</b> LI ZHENG	<b>Art Unit</b> 1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 68-130 is/are pending in the application.
- 4a) Of the above claim(s) 71-79 and 95-130 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 68-70 and 80-93 is/are rejected.
- 7) ☒ Claim(s) 94 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/23/2007; 10/28/2008</u> .                                   | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 68-130 are pending.

### ***Election/Restrictions***

2. Applicant's election with traverse of Group II, claims 68-70, 80-94, and amendments to claims 68, 86 and 100 in the reply filed on 12/2/2008 are acknowledged.

Applicants argue that the Office inaccurately summarize the technical feature linking the inventions thereby leads to the improper restriction requirement (response, page 14, 3<sup>rd</sup> paragraph). Applicants further argue that the correct technical feature is an engrafted plant resistant to viral disease other than by means of expression of an anti-viral protein and a scion susceptible to the viral disease, wherein the engrafted plant is resistant to the viral disease and the rootstock is the only transgenic part of the plant (response, the paragraph bridging pages 14-15).

The Office contends that the technical feature summarized by the Office was accurate. The new technical feature due to the claim amendment is also anticipated by Dougherty et al. (US Patent Number 5, 583, 021). Dougherty et al. teach a transformed plant comprising a construct expressing an untranslatable plus sense RNA molecule. Dougherty et al. also teach transforming the rootstock of plants that become viral

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resistant. Dougherty et al. also teach a plant with transgenic rootstock and an untransformed scion (Example I and II).

Claims 71-79, 95-130 are withdrawn for being drawn to non-elected inventions.

Claims 68-70, 80-94 are examined on the merits.

The requirement is still deemed proper and is therefore made FINAL

### ***Claim Objections***

3. Claim 94 is objected to because it depends on a rejected claim.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 68-69 are rejected under 35 U.S.C. 102(b) as being anticipated by Dougherty et al. (1996, US Patent Number 5, 583, 021).

The claims are drawn to a plant comprising a transgenic rootstock resistant to a viral disease other than by means of expression of an anti-viral protein and a scion susceptible to the viral disease, wherein the engrafted plant is resistant to said viral disease and the rootstock is the only transgenic part of the plant; or wherein the

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transgenic rootstock resistant to a viral disease comprises a nucleic acid sequence having at least 90% identity to at least one segment of the viral genome.

Given a broad interpretation of “one segment of the viral genome” (emphasis added), the nucleic acid sequence reads on any sequence.

Dougherty et al. teach a transformed plant comprising a construct expressing an untranslatable plus sense RNA molecule. Dougherty et al. also teach transforming the rootstock of plants that become viral resistant. Dougherty et al. also teach a plant with transgenic rootstock and an untransformed scion (Example I and II). The recitation “an untranslatable plus sense RNA molecule” means that the RNA do not encode an antiviral protein. The rootstock of Dougherty et al. is the only transgenic part of the plant. Therefore, the reference teaches all the limitations set forth by the instant claims.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 68-70, 80-83, 85-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dougherty et al. (1996, US Patent Number 5, 583, 021) as for claims

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68-69, in view of Heifetz et al. (US Patent Number 7,019,195) and Sonoda et al.(2000, The Plant Journal 21:1-8).

Claims of 68-69 are described above.

Claims 70, 80-83, 85-93 further contain limitation that the transgenic rootstock resistant to a viral disease comprises a DNA construct designed for generating siRNAs targeted to the at least one segment of the viral genome; or that the DNA construct comprises nucleic acid sequence encoding RNA sequence that forms at least one dsRNA that mediates cleavage of the at least one segment of the viral genome; or that the dsRNA comprises a first and a second nucleotide sequence each comprising at least 20 contiguous nucleotides having at least 90% sequence identity to a segment of said viral genome; or that a spacer is between the first and the second nucleotide sequence; or that the first and the second nucleotide sequences operably linked to the same promoter; or that the virus is a Beet necrotic yellow vein virus (BNYVV) or a potyvirus; or that the at least one segment of the viral genome comprises fragments of a nucleic acid sequence having at least 90% identity to SEQ ID NO: 2.

Given the broad interpretation of “a segment” and “a fragment” to encompass as short as a dinucleotides, the recitation “fragments of a nucleic acid sequence having at least 90% identity to SEQ ID NO: 2” or “at least 20 contiguous nucleotides having at least 90% sequence identity to a segment of said viral genome” reads on almost any nucleotide sequence.

The teaching of Dougherty et al. is discussed as above.

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Dougherty et al. do not teach limitation that the transgenic rootstock resistant to a viral disease comprises a DNA construct designed for generating siRNAs targeted to the at least one segment of the viral genome; or that the DNA construct comprises nucleic acid sequence encoding RNA sequence that forms at least one dsRNA that mediates cleavage of the at least one segment of the viral genome; or that the dsRNA comprises a first and a second nucleotide sequence each comprising at least 20 contiguous nucleotides having at least 90% sequence identity to a segment of said viral genome; or that a spacer is between the first and the second nucleotide sequence; or that the first and the second nucleotide sequences operably linked to the same promoter; or that the virus is a Beet necrotic yellow vein virus (BNYVV) or a potyvirus; or that the at least one segment of the viral genome comprises fragments of a nucleic acid sequence having at least 90% identity to SEQ ID NO: 2.

Heifetz et al. teach a method for conferring resistance to more than one potyvirus by introducing into a plant cell more than one pair of DNA sequence wherein for each pair, the first DNA sequence encodes a portion of the viral genome of a potyvirus and the second DNA sequence of the pair encodes a sequence that is antisense to the first DNA (claim 1), wherein the RNA sequence encoded by the first and the second DNA are in one RNA molecule and there is a intron sequence as a linker (spacer) between the first and the second DNA sequence. Heifetz et al. further teach the DNA sequence is from BNYVV.

Given the recognition of those of ordinary skill in the art of the value of generation of an engrafted plant with increased resistance to virus, it would have been obvious for

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a person with ordinary skill in the art to modify the transgenic rootstock of Dougherty et al. with the construct of Heifetz et al. and engraft a susceptible scion to the modified transgenic rootstock as taught by Dougherty et al., resulting in the instant invention. One skilled in the art would have been motivated to do so, given the teaching of Sonoda et al. that transmission of PTGS occurs efficiently from root stock to scion (abstract).

Thus the claimed invention would have been *prima facie* obvious as a whole to one of ordinary skill in the art at the time it was made, especially in the absence of evidence to the contrary.

6. Claims 68-70, 80-93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dougherty et al. (1996, US Patent Number 5, 583, 021) as for claims 68-69, in view of Heifetz et al. (US Patent Number 7,019,195) and Sonoda et al.(2000, The Plant Journal 21:1-8) as for claims 68-70, 80-83, 85-93, further in view of AB489142 (2001, Genbank Accession Number) .

Claims 68-70, 80-83, 85-93 are discussed above.

Claim 84 further contains a limitation of a intron having SEQ ID NO: 3.

Dougherty et al. in view of Heifetz et al. and Sonoda et al. do not teach a intron with SEQ ID NO: 3.

AB489142 teaches intron sequence of CAT1 having the sequence of SEQ ID NO: 3 (alignment attached).



It would have been obvious to use the intron with SEQ ID NO: 3 of AB489142 as the spacer because any functional plant intron sequence would have been regarded as obvious designed choice for a spacer in a dsRNA silencing construct including the intron from CAT1 gene having the sequence of SEQ ID NO: 3.

Thus the claimed invention would have been *prima facie* obvious as a whole to one of ordinary skill in the art at the time it was made, especially in the absence of evidence to the contrary.

### ***Conclusion***

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Zheng whose telephone number is 571-272-8031. The examiner can normally be reached on Monday through Friday 9:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached on 571-272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Li Zheng/  
Examiner, Art Unit 1638

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